Exemption No. 7410

UNITED STATES OF AMERICA
DEPARTMENT OF TRANSPORTATION
FEDERAL AVIATION ADMINISTRATION
RENTON, WASHINGTON 98055-4056

In the matter of the petition of **Georgian Aerospace Group Inc.** for an exemption from § 25.857(e)(4) of Title 14, Code of Federal Regulations	**Regulatory Docket No. 30178**

GRANT OF EXEMPTION

By letter of August 4, 2000, Mr. Daniel J. Utterson, Project Engineer, Georgian Aerospace Group, Inc., 750 N. Beechcraft Ave., Chesterfield, MO 63005, petitioned for an exemption from the requirements of § 25.857(e)(4), of Title 14, Code of Federal Regulations (14 CFR). The August 4, 2000, letter was superseded by letter of August 23, 2000. Additional information was submitted by Georgian Aerospace in a facsimile dated November 8, 2000. The proposed exemption, if granted, would exempt Sabreliner Models 40 and 60 series airplanes, modified for the carriage of cargo, from the requirement to exclude hazardous quantities of smoke, flames, or noxious gases from the flight crew compartment.

The petitioner requests relief from the following regulation:

> **Section 25.857(e)(4)**, states that a Class E cargo compartment is one on airplanes used only for the carriage of cargo and in which there are means to exclude hazardous quantities of smoke, flames, or noxious gases, from the flight crew compartment.

ANM-00-691-E

Related Sections of the Federal Aviation Regulations (FAR):

Section 25.831(e) reads: Except as provided in paragraph (f) of this section, means must be provided to enable the occupants of the following compartments and areas to control the temperature and quantity of ventilating air supplied to their compartment or area independently of the temperature and quantity of air supplied to other compartments and areas:

(1) The flight crew compartment.

(2) Crewmember compartments and areas other than the flight crew compartment unless the crewmember compartment or area is ventilated by air interchange with other compartments or areas under all operating conditions.

The petitioner's supportive information is as follows:

NATURE & EXTENT OF RELIEF SOUGHT

"In accordance with Title 14 Code of Federal Regulation (CFR) 11.25, Georgian Aerospace Group, Incorporated (GAG) hereby petitions the Federal Aviation Administration (FAA) for exemption from the requirements outlined in Title 14 Code of Federal Regulations 25.857(e)(4), amendment level 25-93, relating to the requirements for excluding hazardous quantities of smoke, flames or noxious gases from entering the flight crew compartment.

"This Request for Exemption is for Sabreliner Corporation NA-265-40 and -60 series aircraft to be modified per a GAG Class 'E' Cargo Conversion Supplemental Type Certificate (STC), as outlined in the STC Project Number ST2623WI-T.

"The GAG Class 'E' Cargo Conversion STC, converts a smaller transport turbojet aircraft originally certified as corporate passenger aircraft to carry cargo, popularly known as 'light cargo'. The GAG believes that the design of an airplane for 'light cargo' and the associated operation of the airplane in a non-passenger carrying capacity, should justify an exemption. In addition GAG has proposed alternative requirements which provide an appropriate level of safety for the intended use of the airplanes and for the airplanes occupants."

DESCRIPTION OF EACH AIRCRAFT TO BE COVERED

"The exemption petition is applicable to both the Sabreliner 40 & 60 models as the air conditioning/pressurization systems are similar. The following figures are attached from the Sabreliner Maintenance Manual (Sabreliner Corporation Report Number: NA-62-1224) for the Model NA 265-40 and -60. Note the similar location in the forward

pressure bulkhead of the out flow valve. The main differences are aft of the aft pressure bulkhead in the intake and mixing portion of the system. By observation, the key characteristics of these model aircraft are similar enough to warrant treatment in the same exemption petition.

"1. Figure 21-00-1 Air Conditioning System: S/N 282-1 thru -97 and 306-1 thru -63 (2 sheets).

"2. Figure 21-00-2 Air Conditioning System: S/N 282-98 thru -114 and -116 thru -123 (2 sheets).

"3. Figure 21-00-5 Air Conditioning System: S/N 282-115, -124 and Subs and 306-64 and Subs (2 sheets)."

INFORMATION IN SUPPORT OF THE PETITION

"It shall be noted that except for the exemption, the modification will comply with regulatory requirements as called out in the Type Certificate Data Sheet (A2WE) and with some regulations from Title 14 CFR part 25 up to the regulation amendment level of 25-93, effective February 17, 1998. The particular and literal means of compliance with each applicable paragraph of Title 14 CFR 25.857(e) are detailed below.

"Section 25.857(e)(2) - A separate approved smoke detection system will be installed to give a warning to the flight crew. The smoke detectors are FAA approved to TSO-C1c.

"Section 25.857(e)(3) - The existing ventilation (pressurization) controls will be utilized to shut off the ventilating airflow to the cargo compartment. Turning the Pressurization control to "off" position blocks all bleed-air inputs, thus shutting off all ventilation in the aircraft including the crew/passenger (cargo) compartment. The Aircraft Flight Manual (AFM) will require donning of the crew oxygen masks and smoke goggles in case of smoke detection warning. The manual will then require that the ventilation (pressurization) controls be turned to 'off' and that the aircraft descends to a safe altitude.

"Section 25.857(e)(4) - A barrier will be provided between the cockpit and the cargo compartment to exclude flames from entering the cockpit. The barrier will be fabricated of material that meets the requirements of part I from 14 CFR 25 appendix F. The barrier will impede smoke and noxious gases from entering the cockpit.

"Section 25.857(e)(5) - The cargo will be secured with a net to ensure access to the Main Entry Door (the L/H emergency exit) and to ensure an aisle way along the length of the R/H side of the aircraft for a crew member to access the R/H over wing (Type IV) emergency exit. The critical aircraft cargo load conditions and with the resultant net elongation will be considered in the design of the net.

“The Sabre 40 & 60 aircraft have only one (1) air conditioning system which provides air conditioning and pressurization. The outflow valve and emergency outflow valve are installed on the forward pressure bulkhead in the cockpit. The natural draw of the cabin air is forward from the cabin into the cockpit and out the outflow valves. In the case of larger (with a crew and passenger compartment volume greater than 800 cubic feet) aircraft, separate controls are required to control temperature and quantity of ventilated air supplied to each compartment per Title 14 CFR 25.831(e). The Sabre 40 & 60 aircraft have a total crew and passenger compartment volume less than 800 cubic feet, thus the existing system lacks the capability to separately control the quantity of ventilated air supplied to each compartment and the crew and passenger compartments are really one (1) compartment.

“In an effort to provide the intended level of safety of Title 14 CFR 25.857(e)(4) to the flight crew, a barrier will be provided between the flight crew compartment (cockpit) and the cargo compartment (cabin) to exclude flames and impede smoke and noxious gases from entering the cockpit. To ensure a toxic smoke or gas hazard will not incapacitate the flight crew, the smoke detection system with the cockpit smoke barrier will warn the crew of the hazard in ample time to don safety equipment in accordance with approved procedures in the Aircraft Flight Manual. To ensure a smoke or gas hazard does not visually impair the flight crew, it will be demonstrated that the existing smoke evacuation procedure evacuates smoke from the cockpit. Both of these exemption criteria will be demonstrated with tests."

"A summary of the existing smoke and fumes evacuation procedure follows:
Don oxygen masks and goggles and open crew oxygen.
Descend to safe altitude for depressurization (14,000 ft if possible).
Cabin Air selector switch shall be set on RAM & DUMP.
Reduce aircraft airspeed to 150 knots.
If below 10,000 ft, open pilot’s sliding window."

"The RAM & DUMP setting on the Cabin Air Selector electrically operates the emergency ram-air-supply valve which is installed in a duct that is attached to the refrigeration unit ram-air-supply duct. This valve is downstream from the ram-air-inlet duct at the lower leading edge tip of the vertical stabilizer. When the normally closed valve is actuated open, ram air flows into the duct that carries conditioned air to the cabin. This setting also actuates the cabin air dump valve and safety valve open to the dump cabin air pressure. Positioning the Cabin Air selector at RAM & DUMP does shut off the engine bleedair.

“The root issue for the applicable rule has been addressed and the net result of the exemption remains that a suitable level of safety is preserved. The flight crew are

assured ample time to don safety equipment and means to evacuate smoke from the flight crew compartment."

COMMENTS IN THE PUBLIC INTEREST

“Approval of this request for exemption for the Sabre 40 & 60 when configured for cargo carrying applications, and operated under FAR part 135, is in the public interest of the people of the United States of America for the following reasons:

"1. The FAA allows other aircraft of the same models and similar models to continue to operate in a 'Class A' Cargo Configuration which does not meet the specifications applicable for such a classification and are improperly classified as such (reference FAA Order 8300.10, Appendix 3, Bulletin Number HBAW 98-12A, effective Date 07-03-98) and the FAA continues to allow these operators to clearly violate the rule (reference Draft FAA Order 8300.10, Appendix 3, Bulletin Number HBAW 00-tbd, effective date tbd). New operators depending on this modification continue to lose revenue to these other operators and are not even allowed to compete. Approval of this exemption would allow GAG to accomplish an STC to meet the requirements in contrast with the existing 'Class A' modified aircraft.

"2. In evaluating the rule, the only way practical way to show conventional compliance (per AC 25-9A) with the rule would be to separate the flight crew and cargo compartment with separate pressurization and ventilation systems. The recurrent costs have been estimated to approximately $150,000 with one time certification costs of $125,000. The Sabre 40 is valued at approximately $600,000 with low time airframe and engines. The recurrent costs would be 25 percent of the aircraft value without increasing the cargo carrying capacity or increasing the revenue possibilities of the aircraft, making the modification economically impractical.

"3. An older Civil Air Regulations (CAR) 3 aircraft could be used in place of a safer CAR 4b aircraft to avoid the 25.857(e)(4) rule altogether. The safety of the flight crew and public on the ground will be enhanced by use of the newer transport category aircraft.

"4. These aircraft are an asset for the American Industry, for example, parts that are carried on demand for the automotive industry. When dispatched, as little as one box of parts can be carried to a factory whose assembly line has been temporarily shut down. These companies are Ford, General Motors, Daimler Chrysler, and others, both large and small in scope. These companies no longer inventory parts, but schedule their delivery of parts on an 'on demand' basis, now an industry standard. If the parts are delayed and an assembly line has to shut down, is can cost these companies anywhere from $6,000 to $10,000 per minute of assembly line closure.

"5. These aircraft are an asset to the American public, as human organs are carried on demand, along with other urgently needed medical supplies for doctors and the medical field. It is necessary for these doctors, patients and hospitals to have this service available to them and on a cost effective basis. Time is of critical importance in these instances in order to maintain viability of the organ being transported and commercial air carriers can not meet the requirements.

"6. Given the proliferation of small transport category airplanes currently taking place, and anticipated in the near future, approval of this exemption will enable the United States manufacturers and modifiers of transport category airplanes to effectively compete in this expanding market, while contributing to the U.S. economy.

"7. Additional sales of United States manufactured airplanes outside of the traditional airline market, and modifications of many of them at United States owned and operated aircraft repair stations, will serve to increase the profitability of these manufacturers, their supplying/supporting companies and the repair stations.

"8. Stability and improved financial performance of these United States companies gives greater job stability to the workers employed by the companies, causing a stabilizing influence to the greater United States economy, due to the consumer pending activities associated with stable workers.

"9. Improved financial performance of United States owned and operated corporations, and increased workforce stability translates into continued and improved local, state, and federal tax revenues which in turn adds to the stability of the total United States economy.

"10. Improved financial performance allows United States corporations to continue to invest in research and development allowing the United States to maintain or improve its competitive position in the world economy."

"In conclusion, we have shown that the exemption is in the public interest and that for the unique configurations and operations provide an equivalent level of safety to that intended by the rules."

A summary of the petition was published in the Federal Register on September 29, 2000 (65 FR 58596). No comments were received.

The Federal Aviation Administration's analysis/summary is as follows:

NATURE & EXTENT OF RELIEF SOUGHT

The petitioner's request is to receive a partial exemption to the requirements of § 25.857(e)(4) to exclude hazardous quantities of smoke, flames, or noxious gases from the flight crew compartment of Sabreliner Models 40 and 60 series airplanes modified, via an STC, for carriage of cargo in a Class E Cargo Compartment while meeting all other applicable regulations.

DESCRIPTION OF EACH AIRCRAFT TO BE COVERED

The FAA is cognizant of the coverage requested for various Sabreliner Models discussed earlier under this title.

INFORMATION IN SUPPORT OF THE PETITION

The petitioner's proposal is to offer a Class E cargo compartment to air cargo operators that:

1. Meets the applicable regulations §§ 25.857(e)(2), 25.857(e)(3), and 25.857(e)(5) by implementing proposed design modifications and AFM procedures.

2. Substantially meets the intent of the requirements of § 25.857(e)(4) so that in case of smoke or fire, entry of hazardous quantities of smoke, flames, and/or noxious gases into the flight crew compartment is minimized but not completely excluded by:

a. Using the existing ventilation system to shut off all airflow to the crew and cargo compartment, and using the emergency ram-air supply and dump (RAM & DUMP) system to provide ventilation to and evacuation of smoke from the crew compartment.

b. Installing a smoke curtain to the forward barrier net and the cargo liner to restrict the forward movement of smoke/fire.

3. Meets all other applicable regulations for a Class E cargo compartment.

The FAA concurs that by implementing the proposed design changes GAG, Inc. should substantially meet the intent of the applicable regulations but not literally comply.

COMMENTS IN THE PUBLIC INTEREST

In response to paragraph 1 of the petition: The FAA agrees that the Handbook Bulletin HBAW 98-12 and subsequent revisions created uncertainty in the air cargo industry, and that there exists the need for an approved STC solution, especially in light of various field approvals granted on various light transport cargo airplanes. The FAA also notes that a standardized certification criteria for issuing STC's for converting Saberliner and other similar airplanes from passenger to cargo configuration is necessary. Although, the Handbook Bulletin has since been cancelled, the FAA is considering rulemaking to bring all of these converted, noncompliant aircraft into compliance.

In response to paragraph 2 and 3 of the petition: The FAA agrees that a literal compliance to § 25.857(e)(4) may require separate ventilation/pressurization systems for the flight crew and cargo compartments. While it may be economically prohibitive to design a second ventilating system for the cockpit of business aircraft, the arguments presented are strictly of an economic nature and of interest to the applicant and/or operators. The petitioner's private financial interests do not necessarily equate to the "public interest." The petitioner is entitled to use a Civil Air Regulations (CAR) 3 aircraft.

In response to paragraph 4 and 5 of the petition: The FAA recognizes that it is in the public interest to use certain part 25 aircraft, such as Sabreliner Model 40 and 60 series airplanes for special delivery of human organs and automotive parts and equipment. Also, it would be in the public interest to establish a standard STC procedure including applicable exemption(s) rather than using previous field approvals. The FAA agrees that the proposed GAG, Inc. Class E cargo compartment STC criteria substantially meets the intent of the requirements of § 25.857(e)(4) and does offer full compliance in all other areas.

In response to paragraphs 6 through 10 of the petition: The petitioner's statements are related to the economic benefits to industry, their financial health, and job stability, issues not related to aviation safety.

In summary, the FAA concurs that the combination of barrier nets, a smoke curtain, a smoke detection system, supplemental oxygen breathing equipment, access to both L/H and R/H emergency exits, and an approved AFM supplement for emergency procedures (shutting off the normal ventilation and using the RAM & DUMP airflow system) to be followed in case of smoke detection or entry into the cockpit, restricts the intrusion of hazardous quantities of smoke, flames, and/or noxious gases to the cockpit. This design provides an acceptable level of safety, and is an enhancement of safety over the field approval method.

During the flight test, Georgian Aerospace Group must successfully demonstrate that:

1. Toxic smoke or a gas hazard will not incapacitate the flight crew. The smoke detection system with the cockpit smoke barrier must warn the crew of the hazard in ample time to don safety equipment in accordance with approved procedures in the Aircraft Flight Manual.

2. Smoke or a gas hazard does not visually impair the flight crew. It must be demonstrated that the existing smoke evacuation procedure evacuates smoke from the cockpit.

In consideration of the foregoing, I find that a grant of exemption would be in the public interest. Therefore, pursuant to the authority contained in 49 U.S.C. §§ 40113 and 44701, delegated to me by the Administrator (14 CFR § 11.53), Georgian Aerospace Group, Inc. is hereby granted an exemption from 14 CFR § 25.857(e)(4) to the extent necessary to permit supplemental type certification of the Sabreliner Model 40 and 60 series airplanes, modified for the carriage of cargo.

All test results pertinent to this exemption must be documented in a report and a copy provided to the FAA.

Issued in Renton, Washington on December 21, 2000.

/s/ Dorenda D. Baker
Dorenda D. Baker
Acting Manager
Transport Airplane Directorate
Aircraft Certification Service, ANM-100